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SHORT REPORT

Popliteal Artery Entrapment Syndrome: 3 Unusual Features in the Same Patient

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Introduction. *Popliteal artery entrapment syndrome, although uncommon, usually affects young men under 50 years old.*
Report. *We describe the case of a 56 years old woman with acute right limb ischemia due to popliteal and distal arteries thrombosis. She had no history of leg pain and no cardio-vascular risk factor. Diagnosis of popliteal artery entrapment syndrome was made after successful thrombolysis. Treatment was completed surgically.*
Discussion. *Regarding age, sex and clinical manifestation, our patient put together three uncommon features of popliteal artery entrapment syndrome. This diagnosis should be considered even in patients over 50 without any cardiovascular risk factor presenting with subacute or acute limb ischemia.*

Keywords: Acute ischemia; Popliteal artery entrapment; Arterial disease.

Introduction

In the 5 ½ week of foetal life, embryogenesis of both the popliteal artery and the gastrocnemius muscle occur simultaneously. The definitive popliteal artery forms by merging of parts of both deep and superficial popliteal arteries. The proximal attachment of the gastrocnemius muscle grows and migrates from the calcaneum toward the popliteal fossa. Anomalous development of one structure or loss of synchronicity during the process can result in an abnormal course of the vessel which can be entrapped and compressed against the femoral epicondyle by the medial head of the muscle. Five different types of popliteal artery entrapment are described according to the anatomical relationship between vessels and muscles.[1] Whereas Love and Whelan used the term ''popliteal artery entrapment syndrome'' (PAES) in 1965, this congenital disorder was initially described by Stuart in 1879. The first successful surgical treatment was performed in 1959 by Hamming.[2] The typical clinical feature is calf claudication during exercise in a young adult and the treatment is always surgical. We describe an unusual clinical presentation of PAES.

Case Report

A healthy physically active 56 years old woman, without any cardiovascular risk factor nor history of previous leg claudication, presented with sudden onset of rest pain in the right calf after exercising. Because of worsening pain on the next days, she was addressed to a vascular specialist. On physical examination the right foot was cold with a beginning hypesthesia. Right popliteal and pedal pulses were absent and photoplethysmography did not show any signal in the toes. Left pulses and distal blood pressure were normal. A Duplex-US scan showed a thrombosis of

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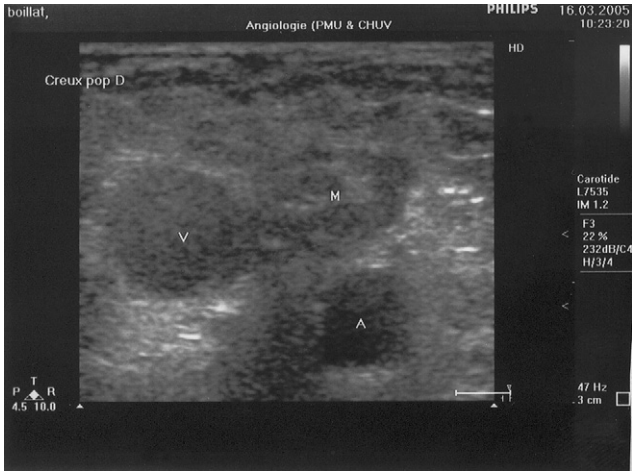

Fig. 1. Echographic image of the popliteal fossa showing the aberrant insertion of the medial head of the gastrocnemius muscle (M) with popliteal artery (A) running medially to it. Popliteal vein (V).

the popliteal artery and the trifurcation. Echocardiography and thoraco-abdominal CT angiogram were normal and thrombolysis with urokinase was performed. Flow in popliteal, peroneal, and tibial arteries was restored and right toe pressure increased to 60 mmHg. Arteriography did not show any popliteal wall anomaly such as aneurysm, plaques or adventitial cyst.

On the next days, the patient complained of persistent severe right calf claudication. A second US revealed an entrapped popliteal artery with aberrant insertion of the medial head of the gastrocnemius muscle between artery and vein (Fig. 1) and significant increase of velocity in the popliteal arterial flow during dorsal flexion of the foot. After confirmation by CT angiogram, diagnoses of a type II PAES was made.

Treatment was completed surgically by section of the medial head of the gastrocnemius muscle and release of the popliteal artery which slipped back into its anatomical position (Fig. 2). Thereafter, claudication resolved and flow remained normal during dorsal foot flexion. There was no relapse at one year.

Discussion

The prevalence of PAES ranges from 0,17% to 3,5%. Most patients (90%) are male and the abnormality is bilateral in approximately 30%.[3] Age of presentation is usually between 20 and 30 years old, but PAES has been reported in a 7 years old boy[4] and in a 73 years old man. Usual presentation of PAES is an intermittent claudication of the calf muscles during exercise.

Because of the atypical clinical presentation and the findings of the first Duplex-US we incorrectly considered a thromboembolic origin or an acute arterial thrombosis due to a ruptured plaque. Correct diagnosis of PAES was made later as there was a persistent calf claudication despite a good arterial flow on distal arteries. We used B-Mode US to demonstrate interposition of the muscle between the popliteal vein and artery and pulsed color-Doppler to assess flow acceleration during dorsal foot flexion. This test, although highly suggestive, has a low specificity with more than 70% of false positive.[3] Therefore a CT angiogram was performed to confirm the diagnosis before surgery. In cases of chronic damage to the vessel wall by repeated compression as it can be seen in young athletes due to muscle hypertrophy, a bypass is required. In our patient popliteal artery wall was found intact. Thus surgery aimed only to release the artery.

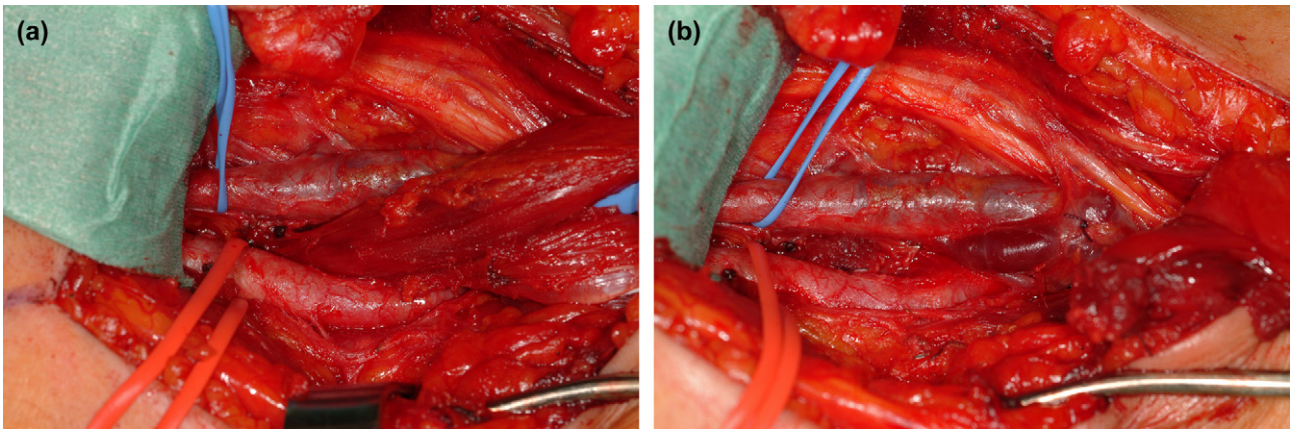

Fig. 2. Perioperatively view of the popliteal fossa showing the situation before section of the medial head of the gastrocnemius muscle (a) and after the release of the artery completed by section of the muscle (b).

PAES is rare in women with a sex ratio of 10 men:1 woman,[5] only 10% of patients are more than 50 years old[1] and a very small number present with an acute lower limb ischemia without previous history of claudication.[2] Our patient showed 3 unusual features of PAES. Therefore, differential diagnosis should include PAES in patients with acute lower limb ischemia.

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